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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:

Michael R. Conboy

Serial No. 09/678,637

Filed: October 3, 2000

For: Automated Material Handling System for a Manufacturing Facility Divided Into Separate Fabrication Areas

§ Group Art Unit: 2125
§
§ Examiner: Masinick, Michael D.
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§ Atty. Dkt. No.: 5000-83702
§ TT1555CPA-D
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CERTIFICATE OF MAILING
37 C.F.R. § 1.8

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Robert C. Kowert
Name of Registered Representative

June 12, 2003
Date

Signature

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Commissioner for Patents
Washington, D.C. 20231

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Respectfully submitted,

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APPEAL BRIEF

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Alexandria, VA 22313-1450

Sir/Madam:

Further to the Notice of Appeal of April 16, 2003, Appellants present this Appeal Brief. Appellants respectfully request that this appeal be considered by the Board of Patent Appeals and Interferences.

I. REAL PARTY IN INTEREST

The subject application is owned by Advanced Micro Devices, Inc., a corporation organized and existing under and by virtue of the laws of the State of Delaware, and having its principal place of business at One AMD Place, Sunnyvale, CA 94088, as evidenced by the assignment recorded at Reel 8636, Frame 0348.

II. RELATED APPEALS AND INTERFERENCES

No other appeals or interferences are known which would directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

Claims 1-22 were present in the original application, with claims 1-15 being cancelled upon filing of this application. Claims 16-22 are pending. Claims 19-22 are objected to. Claims 16-18 stand finally rejected under 35 U.S.C. § 103(a) and are the subject of this appeal. A copy of claims 16-18, as on appeal, is included in the Appendix hereto.

IV. STATUS OF AMENDMEMNTS

Subsequent to the final rejection, an amendment was filed on March 25, 2003. The amendment sought to add two additional dependent claims (claims 23 and 24). In the Advisory Action mailed April 2, 2003, the Examiner denied entry of this amendment. The Appendix hereto reflects the current state of the claims on appeal (claims 16-18).

V. SUMMARY OF THE INVENTION

Manufacturing facilities often employ material handling systems to move materials in various states of production (i.e., work pieces) between processing locations. Containers or carriers are commonly used to move the work pieces from one processing

location to another during the manufacturing process. Some manufacturing processes, such as semiconductor (e.g., integrated circuit) fabrication, may be very sensitive to contaminants. One way to minimize deposition of contaminants on work pieces is to perform sensitive fabrication processes in separate areas isolated from other "dirtier" fabrication areas. *See* specification, pp. 1-2.

If the same containers are used to transport work pieces from one fabrication area to another, contamination may result since containers passed from one area to another may have contaminants clinging to them which may come loose and find their way onto the work pieces. One method of preventing passage of container-entrained contaminants into what should be a "clean room" environment from a relatively dirty room is to transport only the work pieces between rooms and not the containers in which they reside. *See* specification, p. 3, lines 2-19. However, container-less work piece transfer may complicate tracking the location of the work pieces throughout the manufacturing process. The container will no longer indicate the correct location for the work pieces once the work pieces are moved to another work area by container-less transfer.

Container-less work piece transfer may also require greater numbers of and coordination of containers in each fabrication area. Transportation of empty containers to receive work pieces being transferred from another fabrication area requires time, causing a delay in the processing of work pieces. The cumulative cost of such time delays may be substantial in a large fabrication facility. Providing a relatively large number of empty containers in order to minimize the delay times may be prohibitive, however, both in terms of initial container costs and container storage costs. An increased number of empty containers may require more and/or larger stock areas for storage, and does not necessarily reduce the number of required container moves or increase production efficiency. Adequate distribution of the containers such that a sufficient number of empty containers are available when and where they are needed may be complicated. *See* specification, p. 3, line 19 - p. 4, line 14.

In one embodiment of the present invention may provide a method of tracking the location of a work piece within a manufacturing facility including multiple fabrication areas. The method may be employed for an automated material handling system 10 for a manufacturing facility divided into separate fabrication areas, e.g. 14 and 16. *See* Fig. 1; specification p. 10. The automated material handling system may plan and carry out the movement of work pieces between fabrication areas and may maintain a database indicating the location of the work pieces within the manufacturing facility. In one embodiment, the automated material handling system accomplishes the container-less transfer of work pieces through a wall 12 separating a first fabrication area 14 and a second fabrication area 16. The work pieces may be transported within containers 24 (e.g., wafer cassettes or "boats"). The material handling system may include a number of transfer tools, including one or more air lock chambers 18, mass transfer systems 26, robotic arms 20, and stock areas 22. The material handling system may also include a control system which governs the operations of the transfer tools as well as the dispersal of containers within the manufacturing facility and tracks the location of work pieces. *See* specification, pp. 10-11.

In one embodiment, the control system 48 may include a main processor 50, a remote processor 52 associated with each fabrication area, an internal network transmission medium which couples the main processor to the remote processors, and a network transmission medium within each fabrication area which couples the corresponding remote processor to one or more transfer tools. *See* Fig. 4. In one embodiment, the main processor may receives messages from a host processor via an external network transmission medium. The main processor may produce one or more transfer commands in response to each message directing a work piece transfer operation, and transmit the transfer commands upon the internal network transmission medium. A transfer command may direct activities coordinated by the remote processors for movement of one or more work pieces from the first fabrication area to the second fabrication area. *See* specification, p. 12, line 24 - p. 15, line 11.

The method may include maintaining a database 60 which includes entries for each work piece (or grouping of work pieces). Associated with each work piece is a location database entry indicating the fabrication area in which the work piece is currently located. Following the transfer of a work piece from one fabrication area to another, the location database entry associated with the production unit is updated to indicate the fabrication area in which the production unit is currently located. *See* specification, p. 15 lines 13-23.

In one embodiment, remote processors taking part in a transfer operation plan the portions of the transfer operation involving the transfer tools located within the corresponding fabrication areas. During such planning, the remote processors may take into consideration, for example, the distance associated with each possible route, the amount of time required to complete the transfer along each possible route, and the utilization history of each transfer tool which may be involved in the transfer. Weighing all such factors, the remote processors select the transfer tools which will participate in the transfer operation.

In one embodiment, the main processor may govern the dispersal of empty and non-empty containers within each fabrication area and among all of the fabrication areas. Empty and non-empty containers within a given fabrication area are substantially evenly distributed between the stock areas within the fabrication area in order to reduce the total number of containers and the required sizes of the respective empty and non-empty container storage areas within the stock areas. Movements of empty and non-empty containers are accomplished such that empty and non-empty containers do not accumulate within a small portion of the total number of fabrication areas. *See* specification, p. 15, line 27 - p. 18, line 21. In one embodiment, following completion of a transfer, the main processor may update one or more database entries associated with the work piece to indicate the container number and fabrication area containing the work piece. *See* specification, p. 18, lines 23-27.

VI. ISSUES

Whether claims 16-18 are patentable under 35 U.S.C. § 103(a) over U.S. Patent No. 4,781,511 to Harada et al. in view of U.S. Patent No. 5,434,775 to Sims et al.

VII. GROUPING OF CLAIMS

Claims 16-18 stand or fall together for purposes of this appeal only.

VIII. ARGUMENT

Claims 16-18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,781,511 to Harada et al. (hereinafter "Harada") in view of U.S. Patent No. 5,434,775 to Sims et al. (hereinafter "Sims"). Appellants assert that the Examiner has not established a *prima facie* case of obviousness in regard to claims 16-18 for at least the following reasons.

Harada in view of Sims does not teach a method of tracking the location of a work piece within a manufacturing facility, wherein the work piece is located within a first fabrication area and is to be transferred to a second fabrication area, the method comprising: providing a database including a location entry for the work piece, wherein the location entry indicates the work piece is located within the first fabrication area; transferring the work piece from the first fabrication area to the second fabrication area; and updating the database location entry to indicate the work piece is located within the second fabrication area, as recited in claim 16. The Examiner admits that Harada does not teach the tracking features of Appellants' claimed invention. The Examiner relies on Sims to teach the tracking features. However, Sims does not teach or suggest tracking the location of a work piece in a manufacturing facility between fabrication areas. In contrast, Sims describes managing an inventory of medical equipment in a hospital by determining the locations and conditions of devices on a

network of communication links (Sims, col. 5, lines 4-9). Examples of such equipment in a hospital setting include patient care devices such as infusion pumps, vital signs monitors, sequential compression devices, pacemakers, and EKG machines, as well as other types of devices (e.g., electric blankets) (Sims, col. 6, lines 16-20). Unlike work pieces referenced in Appellants' invention, the medical equipment being tracked in Sims has already been manufactured. Also, the hospital setting of Sims is clearly not a manufacturing facility having fabrication areas. The teachings of Sims do not pertain to work pieces being transferred between fabrication areas in a manufacturing facility.

Furthermore, the combination of Harada and Sims is improper because the technique used by Sims to track hospital devices could not be applied to the semiconductor wafers of Harada. Sims uses an electronic "Tag 30 [that] includes an integrated circuit memory 32 disposed within a metal housing 34.... Housing 34 is press fit onto one end of a plastic card 44 ... the opposite end of which is ... attached to the device 12 by a tether 46 (e.g. an 18" steel cord)." Such a tracking device could not be attached to a semiconductor wafer during manufacturing without destroying the semiconductor wafer. Therefore, one of ordinary skill in the art would not have any motivation to apply the teaching of Sims to Harada.

The Examiner argues in the Final Action that the tracking device of Sims, or other prior art tag-tracking devices, could be used to track the semiconductor wafer work pieces of Harada by placing the tracking devices upon the containers used to transport the work pieces. However, this approach would successfully track only the container's location, not the work piece's location. For example, if one attempted to track semiconductor wafer work pieces 7 in Harada by attaching a tracking device to wafer cassette 6, the tracking device would not follow the movement of the work pieces 7 from one fabrication area to another. Referring to Harada's Figure 3, assume a wafer cassette 6 with a tracking device was loaded into port 28 of the wafer processing equipment 20. After the wafers 7 had been processed and moved to a different wafer cassette at port 30, the tracking device would incorrectly indicate that the work pieces were still located at port 28. Therefore,

one of ordinary skill in the art would not use a tag-tracking device (such as in Sims and the other cited art) to track the location of the semiconductor wafer work pieces of Harada.

In the Advisory Action, the Examiner discounts this argument on the basis that the "claims [are] not directed to tracking devices directly attached to [the] workpiece, only [to] workpiece tracking." Apparently the Examiner has misunderstood Appellants' argument. The Examiner is correct only in that the claims do not recite tracking devices directly attached to the work piece. However, the claims are directed to updating a database location entry to track movement of the work piece from one fabrication area to another. If the tracking device of Sims were attached to the wafer cassette in Harada, the movement of the semiconductor wafers from one fabrication area to another would not be tracked because the wafer cassette does not move from one fabrication area to another with the wafers. Appellants are not arguing that the claims require a tracking device directly attached to a wafer. Instead, Appellants are arguing that the combination of Harada and Sims does not teach or enable updating a database location entry to track movement of the work piece from one fabrication area to another because the tracking device of Sims could not be used to track the movement of the wafers from one fabrication area to another in Harada.

Moreover, the Sims reference is not analogous art. "In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992). "A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem." *In re Clay*, 966 F.2d 656, 659, 23 USPQ2d 1058, 1060-61 (Fed. Cir. 1992). Here, Sims is clearly not in the field of Applicants' endeavor. The claimed invention deals with tracking the location of a work

piece within a manufacturing facility including first and second fabrication areas. In contrast, Sims deals with managing an inventory of hospital equipment (Sims, col. 5, lines 4-9). Furthermore, the subject of Sims would not logically have commended itself to an inventor's attention when considering the problem addressed by the claimed invention. One of skill in the art seeking to address the problem of tracking work pieces between fabrication areas in a manufacturing facility would not have any logical reasons for considering a technique used to manage an inventory of hospital equipment using a large tag on a plastic card attached to each hospital device by a tether. Thus, Sims is not within Applicants' field of endeavor and is not pertinent to the problem addressed by Applicants' invention. Accordingly, Sims is non-analogous art and cannot properly be used to reject Applicants' claims.

In the Final Action, the Examiner states that the tracking system of Sims is "'pertinent to the particular problem with which the applicant was concerned,'" that is, the tracking of small devices around a building." The Examiner has clearly over-generalized the particular problem with the inventors were concerned. *In re Oeticker* refers to the particular problem, not the general problem. The analogous art requirement can always be made meaningless by over-generalizing the problem. Almost any art may be considered pertinent if the problem is stated in general enough terms. That is why the courts have insisted that art use in § 103 rejections be pertinent to the particular problem. The particular problem with which the inventors were concerned pertains to tracking the location of a work piece within a manufacturing facility including first and second fabrication areas and the efficient coordination of tools and containers therein. Sims is clearly not pertinent to this particular problem.

IX. CONCLUSION

For the foregoing reasons, it is submitted that the Examiner's rejection of claims 16-18 was erroneous, and reversal of the Examiner's decision is respectfully requested.

This Appeal Brief is submitted in triplicate along with the following items:

☒ Return Receipt Postcard

☒ Deposit Account Fee Authorization form for the $320.00 appeal brief fee.

Respectfully submitted,

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Date: June 12, 2003

X. APPENDIX

The claims on appeal are as follows.

16. A method of tracking the location of a work piece within a manufacturing facility including a first and second fabrication areas, wherein the work piece is located within the first fabrication area and is to be transferred to the second fabrication area, the method comprising:

providing a database including a location entry for the work piece, wherein the location entry indicates the work piece is located within the first fabrication area;

transferring the work piece from the first fabrication area to the second fabrication area; and

updating the database location entry to indicate the work piece is located within the second fabrication area.

17. The method as recited in claim 16, further comprising placing the work piece within a first container within the first fabrication area.

18. The method as recited in claim 17, further comprising providing an empty second container within the second fabrication area.